Module testing status and X-ray tests

Suvadeep Bose

University of Nebraska Lincoln

(On behalf of the SIDET team)

Outline

- Status at SIDET
- Status of test module test stands
- Person power at SIDET and future plans
- Work with the new TBM08 on HDI
- X-ray test stands – at UIC and KU

Status at SIDET

- We have set up the two cold boxes from UIC
- There are two PC's (Ubuntu linux) and psi46 softwares installed on them
- The chillers are set up
- Cold boxes are connected to the N_2 source
- New HV (Keithley) are in place
- *El Commandante* is talking to the JUMO controller in the Cold boxes
- We have succeeded to talk to the Cold boxes and to the DTB at the same time
- We have two test stands set up – full commissioning yet to happen

- News on chips:

- We received one bare 1x1 BPix sensor last month which we tested and sent to Purdue.
- Currently tests are being performed on
  - one 1x1 bare single ROC
  - one 1x1 bare single ROC for FPix bonded to a sensor

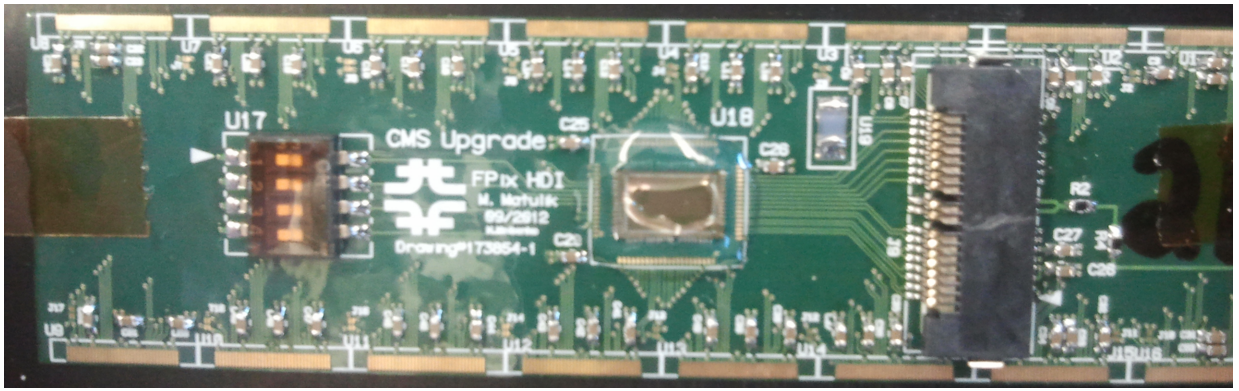
Status at SIDET

Test station 1

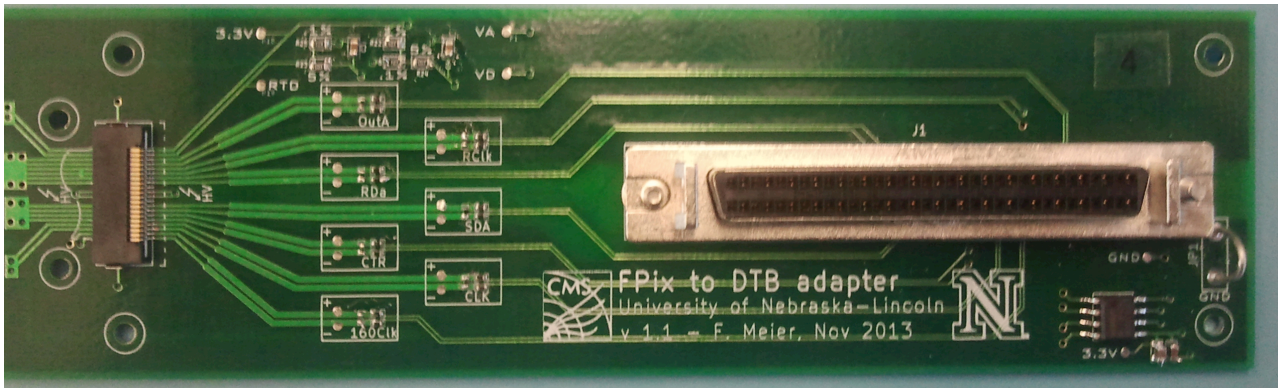
Test station 2

What is available at SIDET ?

1 HDI with TBM08



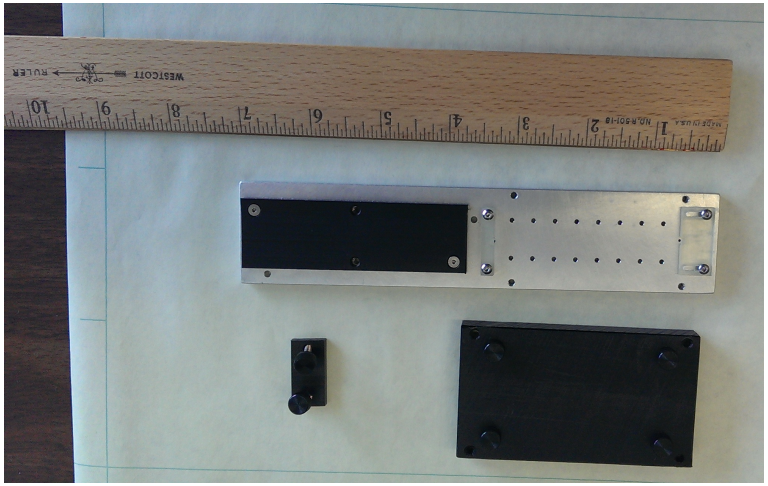
1 Adapter board

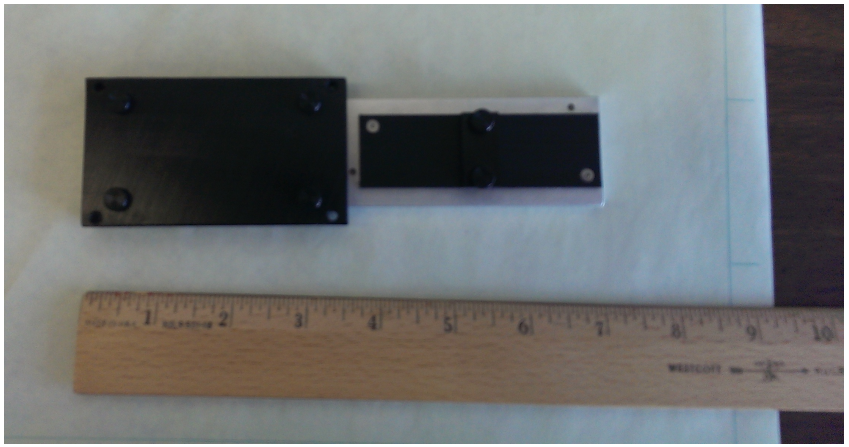


What is available at SIDET? (contd)

1 Prototype Module Carrier board

(We have 5 of them in US, materials have been purchased for 50 and they are being machined at UIC)



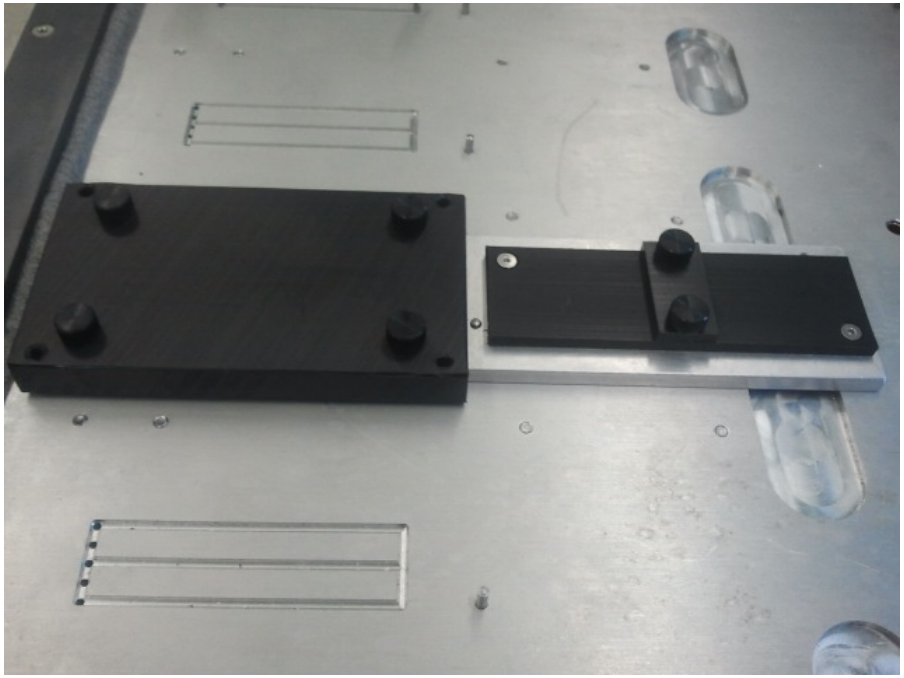


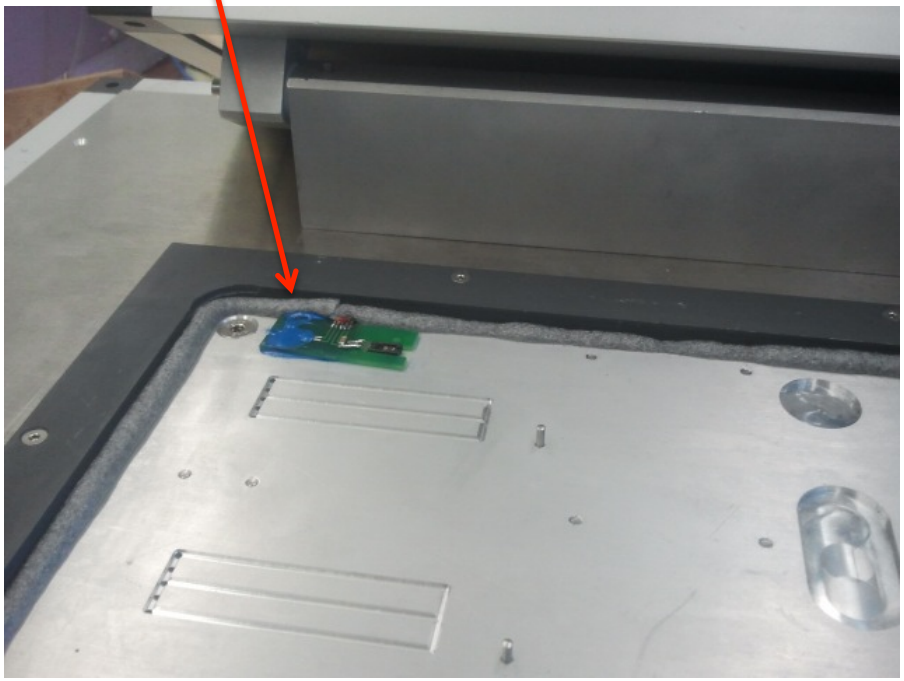
In addition we have

- 4 Digital Test Boards (DTB)
- 12 Single ROC adapter cards
- 2 x 68-pin ribbon cables (standard SCSI cables can be used)

Status of test module test stands

- We tried placing the prototype carrier board on the cold plate of the Cold box
- The carrier board fits well but there is a thermometer at the edge which will prevent the fourth carrier board to sit properly on the plate.

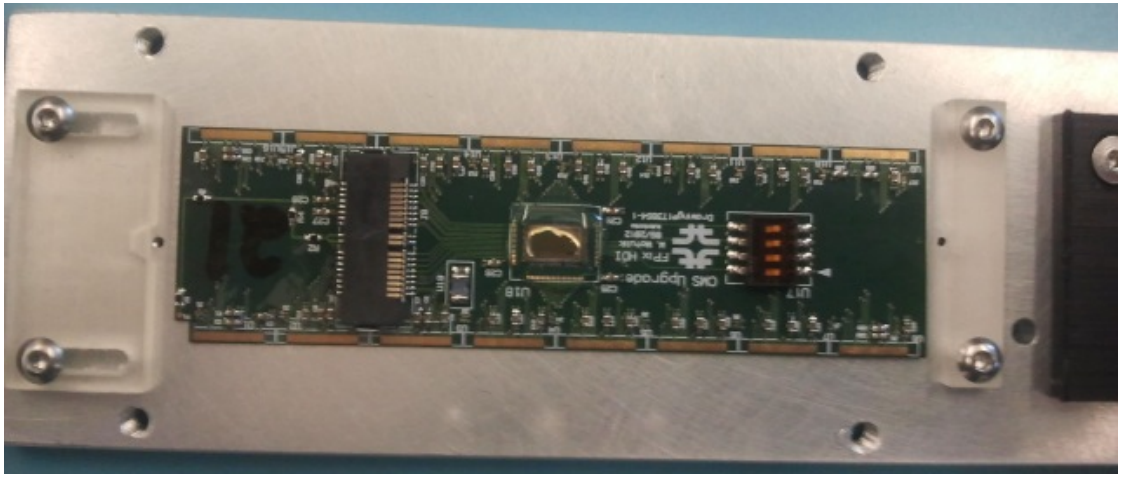


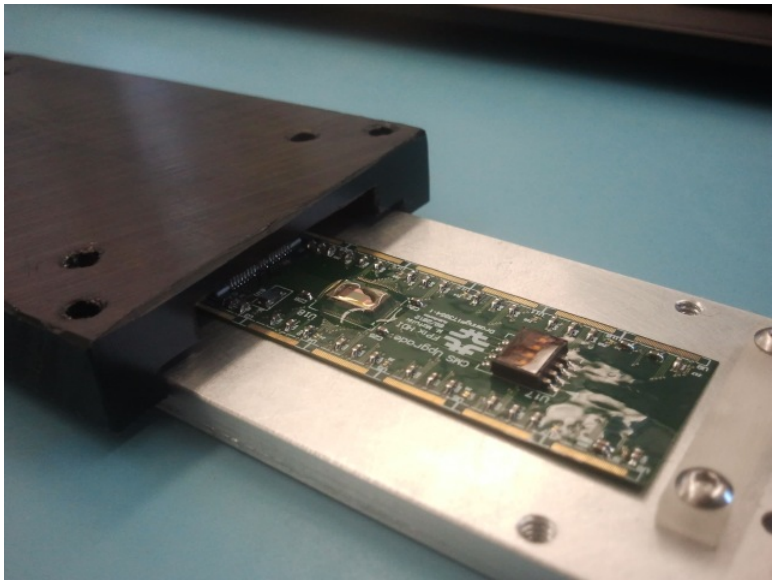


- We have to make arrangements to move it to somewhere else

HDI and the Carrier board

- We also tried placing the HDI inside the prototype carrier board
- It fits fine.





Activities a SIDET and future plans

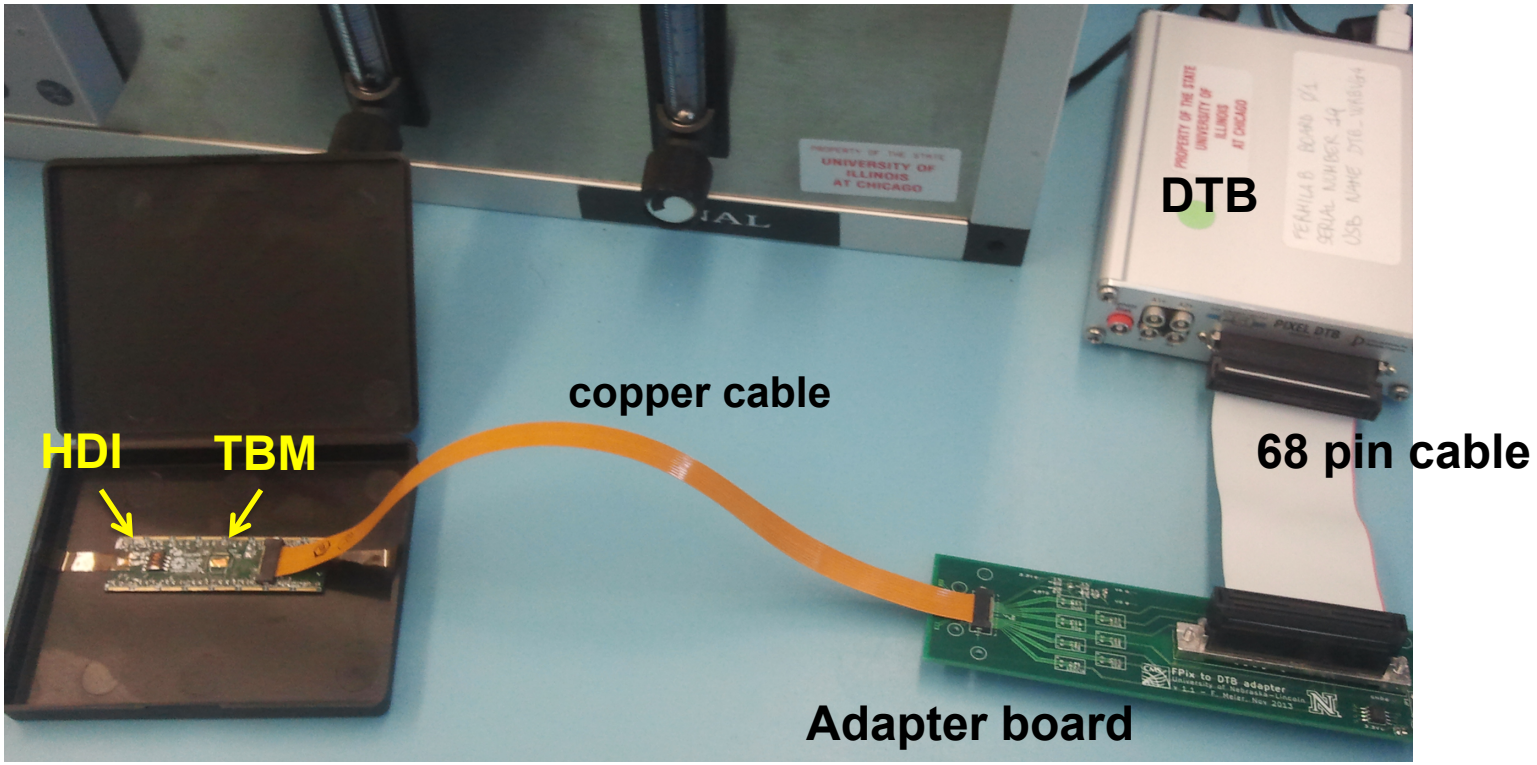
- Person power at SIDET:
  - Douglas Berry (Postdoc, UIC)
  - Suvadeep Bose (Postdoc, UNL)
  - Rafael Coelho Lopes De Sa (Postdoc, Fermilab)
  - Cecilia Gerber (UIC)
  - Daniel Sandoval (PhD student, UIC)
  - John Stupak (Postdoc, Purdue Calumet)
  - Paul Turner (PhD student, UIC)
  - Marco Verzocchi (Fermilab)

- We meet weekly on Mondays at 3 PM (22:00 GVA) in Wilson Hall to discuss the status of work

- In next 2/3 weeks we plan to fully commission the cold boxes, calibrate them and determine the operating conditions.
- In longer term we plan to understand the psi46 software and get involved in its development

Study of TBM08

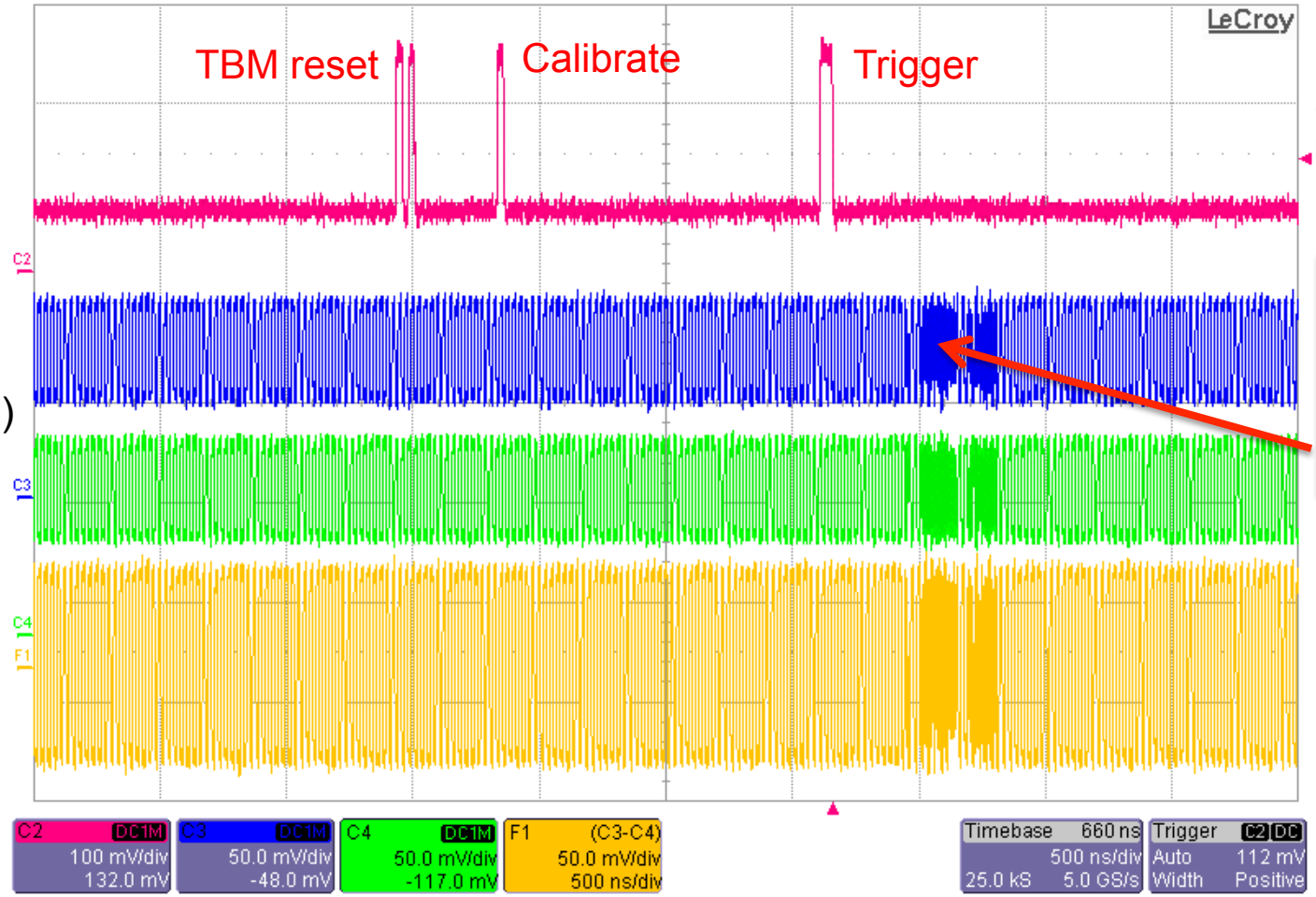
- We wanted to test new firmware that Robert (KU) developed. We have a new Token Bit Manager (TBM08) wire bonded to an HDI without a sensor.



- We have observed the same problem that was seen by others while testing the TBM.

Study of TBM08 (contd)

We tried sending a signal and tried to look at the readout on an oscilloscope. As the test was done with an HDI without sensors the readout will be empty.

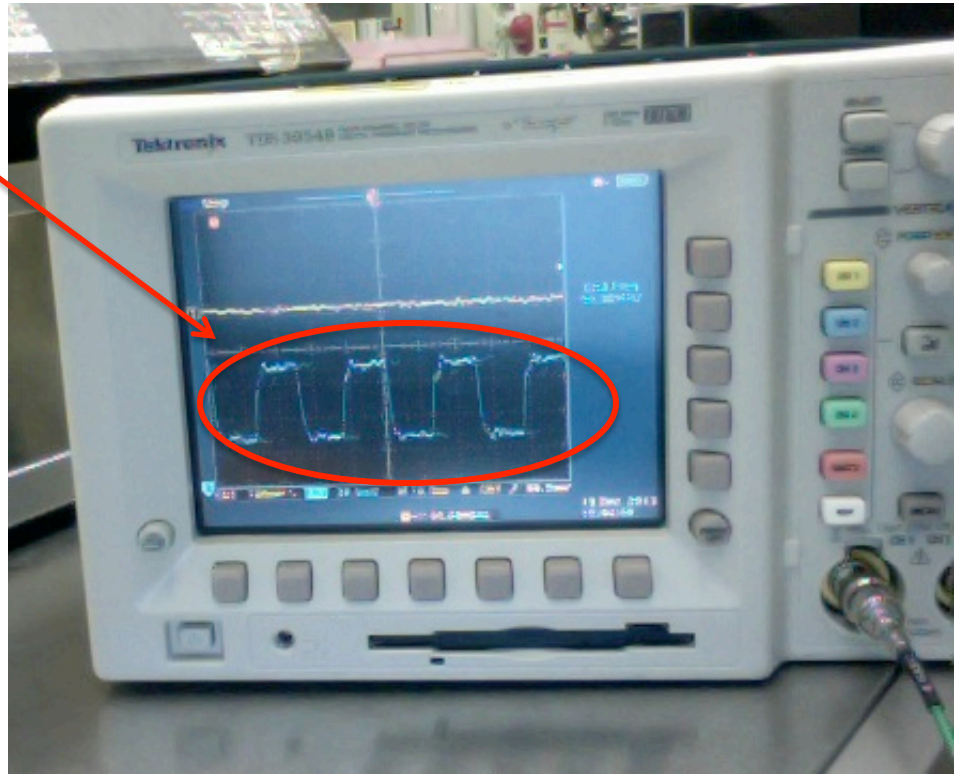


Study of TBM08 (contd)

- We were trying to readout the TBM with the **psi46test** with the new firmware (1.13)
- We tried to **decode** the idle pattern with the DESERializer sending a *single trigger*.

When TBM generates an idle pattern like 0000111100001111
Running DESER we saw that:
dread 0
#samples: 0 remaining: 0
(The dread 0 shows the decoded channel 0)

> dread 1 ((shows a test pattern)
#samples: 10 remaining: 99988
C155=1100000101010101
C156=1100000101010110
C157=1100000101010111
C158=1100000101011000
C159=1100000101011001
C15A=1100000101011010
C15B=1100000101011011
C15C=1100000101011100
C15D=1100000101011101
C15E=1100000101011110

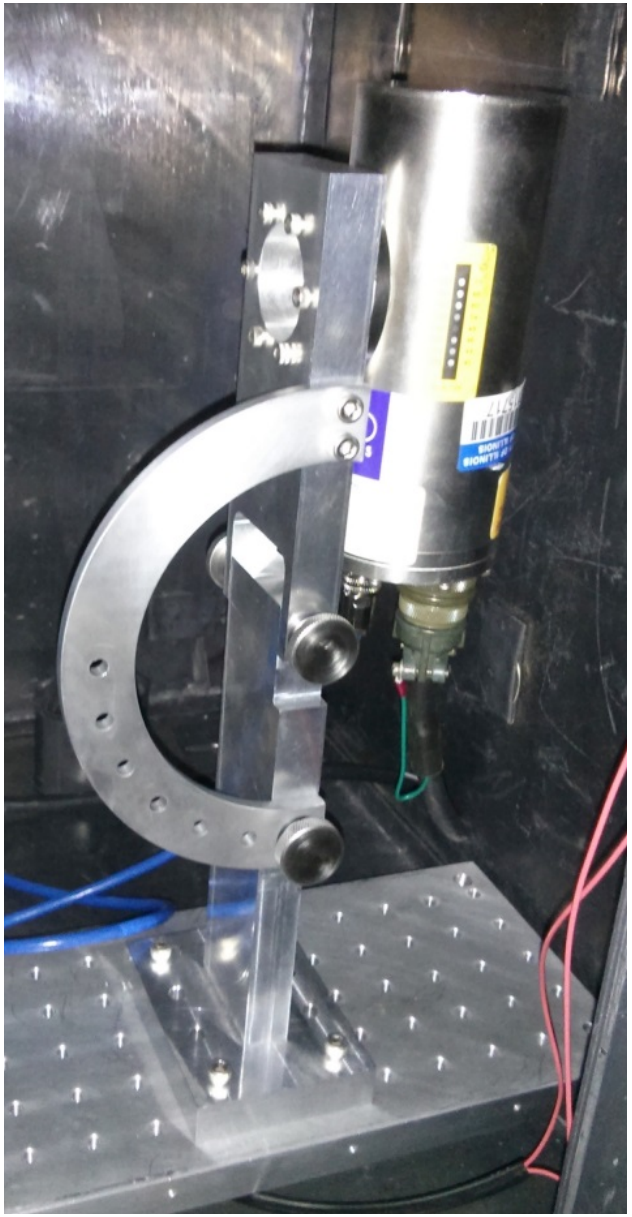


If the DESER receives the idle pattern it does not record anything, thus the 0 samples.
When a trigger comes - the data is recorded.

- **In first look – the DESER seems to be working correctly but further tests will be done at UNL and Fermilab.**

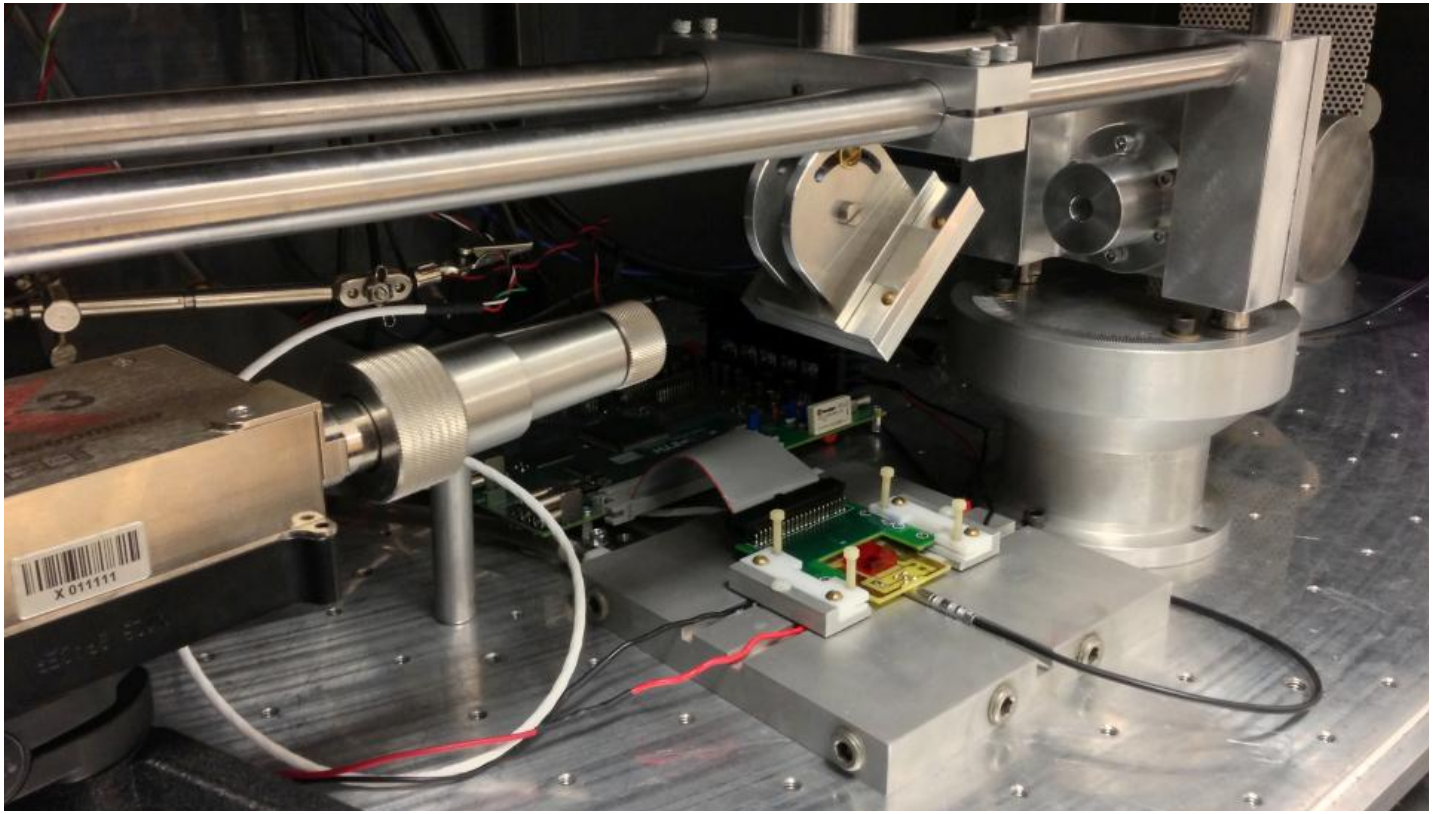
UIC X-ray test stand

- 0-50kV, 0-1mA X-Ray tube mounted on rotary mount for both direct and indirect X- Ray beam
- Fluorescent foils (Cu, Mo, Ag, In, Sn, Tb) and custom computer controlled jig for target selection
- Thermoelectric cold plate with temperature controller (air cooled) w/ support for single module or single ROCs. Capable of chilling down to ~5°C
- Software integration into elComandante to allow “push button” testing



KU X-ray test stand

- 0-50kV, 0-1mA X-Ray tube mounted on rotary mount for both direct and indirect X-Ray beam
- Fluorescent foils (Cu, Mo, Ag, In, Sn, Tb)
- Thermoelectric cold plate with temperature controller (into water bath with radiator).



To be continued ..